AMENDMENTS TO THE CLAIMS

1. (Withdrawn) A method of fabricating a DNA molecule of user-defined sequence, comprising the steps of:

preselecting a multiplicity of DNA sequence segments that will comprise said DNA molecule of user-defined sequence,

separating said DNA sequence segments temporally, and

combining said multiplicity of DNA sequence segments with at least one polymerase enzyme wherein said multiplicity of DNA sequence segments join to produce said DNA molecule of user-defined sequence.

2. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in sequence order.

3. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in an order that is predicted computationally to minimize errors.

4. (Withdrawn) A method of fabricating a DNA molecule, comprising the steps of:

preselecting a multiplicity of DNA sequence segments that will comprise said DNA molecule,

separating said DNA sequence segments temporally, and

combining said multiplicity of DNA sequence segments with at least one polymerase enzyme wherein said multiplicity of DNA sequence segments join to produce said DNA molecule.

5. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 4 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in sequence order.

6. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said step of separating said DNA sequence segments temporally is accomplished by said DNA sequence segments being added gradually, in an order that is predicted computationally to minimize errors.

7. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise n-mers, wherein n is an even number.

8. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise n-mers, wherein n is an odd number.

9. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise n-mers and said n-mers are of a size n+1, n+2, etc.

10. (Withdrawn) The method of fabricating a DNA molecule of user-defined sequence of claim 1 wherein said multiplicity of DNA sequence segments comprise oligos in multiple reading frames.

11. (Currently Amended) A method of producing a DNA molecule of 1-10 kilobases of user-defined sequence from short oligos of length n (n-mers), comprising the steps of:

virtually preselecting a multiplicity of DNA sequence segments that will comprise said DNA molecule of user-defined sequence by using computational

techniques to virtually break said user-defined sequence into virtual fragments of length n (n-mers) of defined size ~~where n is an odd number~~,

providing fragments in vitro by providing fragments of length n (n-mers) of defined size ~~where n is an odd number~~ that correspond to said virtual fragments,

arraying fragments in vitro by arraying said fragments of length n (n-mers) of defined size ~~where n is an odd number~~ into groups,

separating DNA sequence segments temporally in vitro by separating said DNA sequence segments of length n (n-mers) of defined size ~~where n is an odd number~~ temporally, and

assembling groups in vitro by assembling said groups into double-strand DNA molecules of predetermined base-pairs using parallel synthesis, DNA shuffling, and DNA polymerase wherein said step of separating said DNA sequence segments temporally and said step of assembling said groups into double-strand DNA molecules of predetermined base-pairs is accomplished by said DNA sequence segments being added gradually, ~~in sequence order~~ in an order that is predicted computationally to minimize errors to produce said DNA molecule of user-defined sequence, and

wherein said step or assembling said groups into double-strand DNA molecules utilizes starting oligos of length n (n-mers) where n is an odd number.

12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Currently Amended) The method of producing a DNA molecule of user-defined sequence of claim 11 wherein said starting oligos of length n-mers where n is an odd number are of a size n+1, n+2, etc.

17. (Previously Presented) The method of producing a DNA molecule of 1-10 kilobases of user-defined sequence from short oligos of length n (n-mers) of claim 11 wherein said multiplicity of DNA sequence segments comprise oligos in multiple reading frames.